### **Ares Projects Office Progress Update**

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#### **Presentation Abstract**

NASA's Vision for Exploration requires a safe, reliable, affordable launch infrastructure capable of replacing the Space Shuttle for low Earth orbit transportation, as well as supporting the goal of returning humans to the moon. This presentation provides an overview of NASA's Constellation program and the Ares I and Ares V launch vehicles, including accomplishments and future work.

MSFC-508-Presentation National Aeronautics and Space Administration **Ares Projects Office Progress Update** Teresa Vanhooser Deputy Director, Ares Projects Office www.nasa.gov

# **Today's Journey**



- **♦** Where We Are
- ◆ A Nationwide Partnership
- ♦ Ares I Progress Since System Requirements Review
  - Vehicle Integration
  - First Stage
  - Upper Stage
  - Upper Stage Engine
- ♦ The Challenges Ahead

### **Over \$4B in New Procurements**



#### **Orion CEV**

• 16.5 ft diameter

Instrument

Unit

Launch Abort System (LAS)

> Spacecraft Adapter

#### **Upper Stage**

- 305k lb LOx/LH<sub>2</sub> stage
- · 18 ft diameter
- Aluminum-Lithium (Al-Li) structures
- · Instrument unit and interstage
- Reaction Control System (RCS) / roll control for first stage flight
- · Primary Ares I control avionics system
- NASA Design / Boeing Production (\$1.12B contract signed 8/28)

### **Stack Integration**

- 2M lb gross liftoff weight
- 328 ft in length
- NASA-led

Interstage Cylinder

### **First Stage**

- Derived from current Shuttle RSRM/B
- Five segments/Polybutadiene Acrylonitride (PBAN) propellant
- Recoverable
- New forward adapter
- Avionics upgrades
- ATK Launch Systems (\$1.2B contract signed 8/10)

#### **Upper Stage Engine**

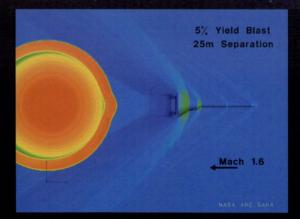
- Saturn J-2 derived engine (J-2X)
- Expendable
- Pratt and Whitney Rocketdyne (\$1.8B contract signed 7/16)



# **Vehicle Integration**



LAS Mock-up



**Abort Simulations** 



**MSFC Systems Integration Lab** 



2,500+ Wind Tunnel Tests

# First Stage





**SRM Test Firing** 



**Nozzle Actuator Tests** 



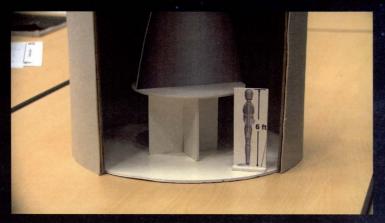
**New SRM Insulation** 



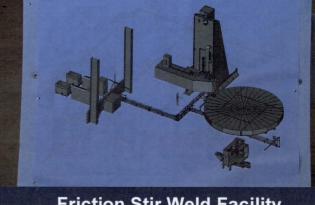
**Parachute Drop Test** 

# **Upper Stage**





Full-scale Interstage Mock-up



**Friction Stir Weld Facility** 



**Confidence Panel Evaluation** 



Saturn IVB Vent Relief Valve Disassembly

# **Upper Stage Engine**





**LOX Inducer Testing** 



Powerpack Disassembly/Installation



**Cold-flow Nozzle Side Loads Testing** 



**Subscale Injector Testing** 

## The Challenges Ahead



### ♦ The Latest Milestone: System Definition Review

- Kick-off conducted September 10
- Standing Review Board participation
- Review board for final dispositions scheduled for October

#### Instrument Unit contract award

Scheduled for the December 2007 time frame

### Preliminary Design Review

Currently slated for mid-2008

### Ares I-X Test Flight

- On track for April 2009 launch
- Ground vibration testing ongoing
- Hardware fabrication underway



www.nasa.gov/ares